

**Remarks**

The Office Action mailed June 30, 2003 and made final has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-12 are now pending in this application, of which Claims 1 and 9 have been amended. It is respectfully submitted that the pending claims define allowable subject matter.

The provisional double patenting rejection of Claims 1-12 is noted. Applicants will respond to the rejection if and when allowable subject matter is found in the noted copending application.

The rejection of Claims 1-12 under 35 U.S.C. § 103 as being unpatentable over Passaro (U.S. Patent No. 3,339,158) in view of McManus (U.S. Patent No. 3,739,302) is respectfully traversed.

Passaro describes a cascaded multi-port junction circulator having a rectangular permanent magnet slab (18) in Figures 1 and 2, and an eight-sided polygonal magnet slab (72) in Figure 3. Passaro neither describes nor suggests alternative shapes of the magnet slabs.

Additionally, Passaro describes a rectangular ferrimagnetic slab (31) in Figure 1, a disk shaped ferrimagnetic slab (50) in Figure 2, and an angularly shaped ferrimagnetic slab (70) in Figure 3. Passaro neither describes nor suggests alternative shapes of the ferrimagnetic slabs.

McManus describes a ferrimagnetic circulator for microwaves having rectangular ferrite pieces (12), (13) and a rectangular magnet (18). McManus neither describes nor suggests an alternative shape for the circulator components.

McManus further describes rectangular ferrite elements (12), and neither describes nor suggests alternative shapes therefor.

Amended Claim 1 recites a radio frequency/microwave junction-type circulator, comprising "a plurality of signal ports," "a plurality of junctions connected in cascade and configured to provide a plurality of transmission paths between the signal ports, each junction including a conductor element patterned to correspond to at least a portion of the plurality of transmission paths," "a ferrite component configured to overlay the plurality of junctions," "an oval shaped permanent magnet arranged in relation to the ferrite component so as to generate a magnetic field in the ferrite component, thereby causing non-reciprocal operation of the plurality of transmission paths between the signal ports," and "at least a first pole piece disposed between the permanent magnet and the ferrite component."

It is respectfully submitted that Passaro in view of McManus neither describe nor suggest the circulator of Claim 1. Neither of the cited references disclose an oval shaped magnet, and each of the references fails to suggest alternative shapes for the magnets therein or to note any disadvantage to the shapes of the magnets therein that would motivate a change in shape of the magnets.

As explained in the specification, the oval shape of the permanent magnet in the present invention provides a number of structural and functional benefits in the circulator of the present invention. The structural and functional benefits of the magnet shape are nowhere described or suggested in the cited art. As the cited art neither expresses any disadvantage to the rectangular and angular shapes of the magnets therein nor expresses any benefit to an alternative shape of the magnets therein, it is respectfully submitted that the oval shaped magnet of the present invention is not obvious over the cited art.

For at least the reasons set forth above, Claim 1 is therefore submitted to be patentable over Passaro in view of McManus.

Likewise, the detail recitations of Claims 2-8, when considered in combination with the recitations of Claim 1, are likewise submitted to be patentable over Passaro in view of McManus.

Independent Claim 9 recites a method of manufacturing a radio frequency/microwave junction-type circulator, comprising the steps of "providing a plurality of junctions connected in cascade and configured to form a plurality of transmission paths between a plurality of signal ports, each junction including a conductor element patterned to correspond to at least a portion of the plurality of transmission paths," "providing a ferrite component configured to overlay the plurality of junctions," "providing an oval permanent magnet arranged in relation to the ferrite component so as to generate a magnetic field in the ferrite component, thereby causing non-reciprocal operation of the transmission paths between the plurality of signal ports," and "providing a first pole piece disposed between the permanent magnet and the ferrite component."

Because Passaro in view of McManus neither describes nor suggests an oval shaped magnet, it is submitted that Passaro in view of McManus does not describe the method recited in Claim 9 including providing an oval magnet.

Claim 9 is therefore submitted to be patentable over Passaro in view of McManus.

Likewise, the detail recitations of Claims 10-12, when considered in combination with the recitations of Claim 9, are likewise submitted to be patentable over Passaro in view of McManus.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1-12 be withdrawn.

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In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

  
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